UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 13, 2020

Mr. Gerald D. Reid, Commissioner
State of Maine – Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

Re: Review and Action on Maine Water Quality Standards, 06-096 Chapter 584

Dear Mr. Reid:

By letter dated April 24, 2020, the Maine Department of Environmental Protection (DEP) submitted new and revised Water Quality Standards (WQS) in accordance with Section 303(c) of the Clean Water Act (CWA). Public notice of this rulemaking was published on October 2, 2019, and October 30, 2019. The Maine Board of Environmental Protection (BEP) held a public hearing on the proposed rulemaking on November 21, 2019. The public comment period closed on December 6, 2019. The BEP voted on, and approved, the Chapter 584 WQS revisions on February 6, 2020. They were filed with the Maine Secretary of State and became effective on February 16, 2020. On April 22, 2020 the Attorney General certified that the 06-096 Chapter 584, Surface Water Quality for Toxic Pollutants amendments were duly adopted as WQS pursuant to State law.

The new and revised provisions in Chapter 584 include human health criteria (HHC), aquatic life criteria (ALC) and site-specific criteria (SSC) for three specific river segments. This letter addresses ALC for ammonia, cadmium, non-substantive WQS revisions, non-WQS provisions, and SSC for the Little Androscoggin and St. Croix Rivers. EPA's decisions concerning these items are detailed in Attachment 1. EPA is not taking action on revised carbaryl criteria or the SSC for the Androscoggin River at this time. EPA has already approved the new and revised HHC in a separate letter dated June 23, 2020.

EPA's approval of the ALC and SSC provisions in Chapter 584 is subject to the consultation requirement of Section 7(a)(2) of the Endangered Species Act (ESA). Under Section 7(a)(2) of the ESA, 16 U.S.C. § 1536, EPA has the obligation to ensure that its approval of these new or revised WQS will not jeopardize the continued existence of threatened or endangered species and their critical habitat.

In a letter dated March 23, 2020, the U.S. Fish and Wildlife Service (USFWS), Ecological Services - Maine Field Office concurred with EPA's finding that Maine's revised state-wide ALC for cadmium and ammonia in addition to the copper SSC for the Little Androscoggin River

are not likely to adversely affect listed species under its jurisdiction. Similarly, in a letter dated July 6, 2020, the National Marine Fisheries Service (NMFS) concurred that Maine's revised state-wide ACL for cadmium and ammonia would not likely adversely affect listed species under its jurisdiction. There are no species under NMFS jurisdiction in the action area for the Little Androscoggin SSC. EPA has concluded that its approval of the SSC for the St. Croix will have no effect on federally listed threatened and endangered species or their critical habitat because there are none in the action area.

We look forward to continued cooperation with Maine in the development and review of water quality standards pursuant to our responsibilities under the CWA. If you have any questions, please contact Dan Arsenault (617-918-1562) or Michael Knapp (617-918-1053).

Sincerely,

KENNETH MORAFF
Digitally signed by KENNETH MORAFF
Date: 2020.07.13 09:12:00 -04'00'

Ken Moraff, Director
Water Division
EPA Region 1

cc:

Brian Kavanah, Director, Bureau of Water Quality, DEP
Mark Margerum, Office of the Commissioner, DEP
Scott Boak, Assistant Attorney General, Chief, Natural Resources Division

Attachment 1
Supporting Discussion of EPA's Decisions Concerning Maine's New and Revised Aquatic Life Criteria and Site-Specific Criteria

Revisions to Maine's ALC and SSC are set forth in DEP's regulations at 06-096 CMR Chapter 584, and in Appendix A to Ch. 584. These revisions include updates to ALC for cadmium, ammonia, and carbaryl and SSC for the Androscoggin, Little Androscoggin and St. Croix Rivers. This letter addresses ALC for ammonia, cadmium, non-substantive WQS revisions, non-WQS provisions and SSC for the Little Androscoggin and St. Croix Rivers. SSC for the Androscoggin River will be addressed in a separate action letter. The regulations also contain revisions to Maine's human health criteria (HHC), which EPA approved in a separate action letter dated June 23, 2020.

EPA reviewed these WQS revisions for consistency with the Clean Water Act (CWA) and federal implementing regulations at 40 CFR Part 131. Pursuant to 40 CFR § 131.11(a), the EPA must ensure that new or revised criteria are based on sound scientific rationale and contain sufficient parameters or constituents to protect designated uses, including subcategories of such uses. Also, consistent with the requirements of the ESA, EPA evaluated the potential impacts of its approval of the WQS revisions on federally-protected species and their critical habitat and determined that consultation with the USFWS and NMFS was necessary. In a letter dated March 18, 2020, the USFWS, Ecological Services - Maine Field Office concurred with EPA's finding that Maine's revised state-wide ACL for cadmium and ammonia in addition to the SSC copper criteria for the Little Androscoggin River are not likely to adversely affect listed species under its jurisdiction. Similarly, in a letter dated July 6, 2020, NMFS concurred that Maine's revised state-wide ACL for cadmium and ammonia would not likely adversely affecte listed species under its jurisdiction.

Provisions EPA is Approving

Cadmium

Maine has updated its acute and chronic criteria for cadmium to be consistent with EPA's nationally recommended 2016 CWA Section 304(a) freshwater and estuarine/marine cadmium ALC, which reflect the latest science for the protection of aquatic life. Pursuant to 40 CFR § 131.11(a), EPA's review of Maine's revised cadmium aquatic life criteria is based on whether the criteria protect aquatic life uses and are based on sound scientific rationale. EPA finds that Maine's revised criteria are scientifically defensible and protective of designated uses for the reasons explained in the EPA's 2016 cadmium criteria document[1].

Parameters and equations for calculating freshwater metals criteria that are hardness-dependent are found in Section 7.B of Chapter 584. The cadmium CMC (acute) and CCC (chronic) criteria are calculated using the following equations:

[1] Aquatic Life Ambient Water Quality Criteria Cadmium – 2016. EPA 820-R-16-002 Available online at https://www.epa.gov/sites/production/files/2016-03/documents/cadmium-final-report-2016.pdf

$$CMC = \exp\{m_A [\ln(\text{hardness})] + b_A\}$$
$$CCC = \exp\{m_C [\ln(\text{hardness})] + b_C\}$$

Where:

$m_A = 0.97899$
$b_A = -3.866$
$m_C = 0.7977$
$b_C = -3.909$

Section 7.B also states "A conversion factor for freshwater cadmium criteria is then applied to the above stated calculation for CCC and CMC as stated in EPA's *Aquatic Life Ambient Water Quality Criteria for Cadmium* (EPA-820-R-16-002) dated March 2016. Freshwater acute and chronic conversion factors for cadmium are 1.011 and 0.976, respectively." The conversion factor is used to convert total cadmium to dissolved cadmium (see page 60 of EPA's 2016 cadmium criteria document). Section 5.A of Chapter 584 states "All metals criteria must be considered as total metal." Therefore, since the revised cadmium criteria are already expressed as total and Maine's regulations specify that metals criteria must be considered as total, a conversion factor is not needed. As stated in a letter from DEP to EPA dated June 29, 2020 (see Exhibit A), EPA understands that DEP will apply the conversion factor when DEP has approved a discharger's request to express criteria for metals as the dissolved form per the note in Ch.584 (5)(A). As currently written, a plain language reading of section 7.B. implies that the conversion factor is always used. EPA further recommends that DEP amend Section 7.B. to clarify that the conversion factor is used to convert total cadmium to dissolved cadmium only in such situations.

Ammonia

Maine has updated its criteria for ammonia to be consistent with EPA's nationally recommended 2013 CWA Section 304(a) freshwater ammonia criteria. The criteria are expressed as functions of temperature and pH, so the applicable acute and chronic criterion magnitudes vary by waterbody, depending on the temperature and pH of those waters. EPA finds that the revised criteria are scientifically defensible and protective of designated uses for the reasons explained in the EPA's 2013 ammonia criteria document[2].

Little Androscoggin River Site-specific Criteria for Copper

Integral Consulting Inc. (Integral) conducted a site-specific study to determine acute and chronic site-specific criteria for total copper in the Little Androscoggin River from the outfall of the Paris Utility District (PUD) in Paris to the confluence of the Little Androscoggin River with the main stem of the Androscoggin River in Auburn. Integral used site-specific data and EPA's current CWA Section 304(a) recommended Biotic Ligand Model (BLM) for copper, as summarized in

[2] Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013. EPA 822-R-18-002. Available online at https://www.epa.gov/sites/production/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf.

the Board of Environmental Protection (BEP) Final Order for the Paris Utility District dated November 20, 2014.

Integral conducted a study of ambient water chemistry in the waters of the Little Androscoggin River downstream of the PUD discharge which included 12 monthly sampling events from July through November 2009 and May through November 2010. From the resulting sampling event data sets, Integral calculated 12 BLM-based instantaneous acute and chronic copper criteria which are summarized in a 2011 BLM report prepared for PUD by Integral.

A probability distribution approach was used to set the standard for copper. This approach is appropriate for protecting the designated use and minimizing the potential exceedance of the allowed frequency (one exceedance in three years), considering the variability of the copper discharge concentration. That is a probability of 0.913 or, viewed the other way, the criteria will not be exceeded 99.087% of the time. The study results were submitted to the BEP in 2014. The BEP issued a Final Order for the PUD dated November 20, 2014. The resulting CMC and CCC are 10.42 ug/L and 6.51 ug/L as dissolved copper, corresponding to a CMC of 10.85 and CCC of 6.78 ug/L as total copper, respectively, using the state's dissolved to total conversion factor. DEP submitted these site-specific criteria to EPA for approval under section 303(c) of the Clean Water Act as part of its April 24, 2020 submission. These site-specific criteria are found in footnote oo of Table 1 in Appendix A of Chapter 584.

The BLM accounts for the effect of individual water quality parameters that modify copper bioavailability and toxicity. The proposed SSC for copper were derived using the EPA recommended BLM methodology, which accounts for the impacts of ambient water chemistry on copper toxicity to aquatic life. When the 2007 Cu BLM was developed, substantial experimental work was evaluated to determine the toxicity of copper to aquatic species and to allow for extrapolation from one exposure condition to another. In this approach ambient water chemistry is analyzed during different seasons to capture the variation in water chemistry over time. Each sampling event provides a data set from which instantaneous acute and chronic criteria are calculated using the BLM. As this model uses the best available science to calculate protective copper criteria, EPA finds that the revised criteria are scientifically defensible and protective of designated uses for the reasons explained in the EPA's 2007 freshwater copper criteria document.

St. Croix River Site-Specific Criteria for Copper, Cadmium, Lead, Zinc and Aluminum

Integral also conducted a site-specific study for the Woodland Pulp LLC facility in Baileyville, Maine, the *St. Croix River Water-Effects Ratios (WER) – Determinations for Cadmium, Copper, Lead, and Zinc* (2019). The study developed a Water Effect Ratio (WER) of 1.2 for acute exposure for cadmium, a WER of 3.0 for acute exposure for copper, a WER of 3.0 for acute exposure and 4.8 for chronic exposure for lead, and a WER of 2.0 for acute exposure for zinc. The WERs apply to the St. Croix from just below the Woodland Dam to tidewater. The WERs for cadmium, copper, lead, and zinc are found in footnotes mm, nn, rr, and ss, respectively, in Table 1 Appendix A of Chapter 584. The WER for aluminum is found in footnote P of Table II Appendix A of Chapter 584.

Prior to undertaking the WER study, Integral provided a draft work plan for DEP and EPA review. Integral incorporated EPA comments into the final work plan. The approach used for conducting the WER tests is consistent with that presented in the final workplan for this site investigation. The methods of evaluation used to develop the WERs are generally consistent with EPA guidance for WER evaluations (U.S. EPA 1994). Based on EPA's review of the final WER report, EPA has concluded that the final selected acute WER values for use by the facility (1.2 for cadmium, 3.0 for copper, 3.0 for lead, and 2.0 for zinc) and resulting SSC values are scientifically sound and protect the aquatic life designated use.

EPA also calculated a site-specific acute criterion for copper using the BLM for comparison as an additional line of evidence for the WER evaluation (Table 1). EPA combined available measured water quality parameter values reported in the WER document (temperature, pH, dissolved organic carbon, alkalinity) with regional water quality data for ecoregion 82, stream order 5 for the missing parameters (ions and sulfide concentrations). The site-specific acute copper criterion of 9.21 µg/L calculated using the WER is more stringent than all the site-specific criteria values calculated with the BLM, further supporting EPA's conclusion that the WER-based acute copper criterion protects aquatic life.

Table 1. Acute Aquatic Life Criteria for Copper Calculated Using Site and Regional Water Quality Data in the Biotic Ligand Model (BLM)

Season	Input Data [1]	BLM-Based Acute Criteria (µg/L)
Winter 2018	temperature: 2.8ºC[2] pH: 6.6[2] DOC: 22.1[2] Ca total: 5.7[3] Mg total: 1.1[3] Na total: 5.1[3] K total: 0.7[3] SO_4: 9.1[3] Cl: 5.7[3] alkalinity: 6.7[2] sulfide: 1E-04[3]	24.7

Summer 2018	temperature: 26.7ºC[2] pH: 6.9[2] DOC: 8.1[2] Ca total: 5.7[3] Mg total: 1.1[3] Na total: 5.1[3] K total: 0.7[3] SO_4: 9.1[3] Cl: 5.7[3] alkalinity: 9.2[2] sulfide: 1E-04[3]	13.8
Fall 2018	temperature: 2.2ºC[2] pH: 6.8[2] DOC: 12.9[2] Ca total: 5.7[3] Mg total: 1.1[3] Na total: 5.1[3] K total: 0.7[3] SO_4: 9.1[3] Cl: 5.7[3] alkalinity: 6.6[2] sulfide: 1E-04[3]	19.2

[1] All input data except pH and temperature are in units of mg/L

[2] Measured value reported in WER Report

[3] Ecoregional Estimate

In addition to the WER study for cadmium, copper, lead, and zinc, a site-specific study for aluminum was conducted by AScI Corporation/AScI-Duluth entitled, *Aluminum Water-Effect Ratio for Georgia-Pacific Corporation Woodland, Maine Pulp & Paper Operations Discharge and St. Croix River* (1996) and provided to DEP. Note that Georgia-Pacific Corporation of Woodland, ME, is now Woodland Pulp LLC. The study developed a WER for acute and chronic exposures of 6.1 for aluminum. The supporting documentation for the WER is summarized in the letter from William R. Beckwith of EPA Region 1 to Barry Mower, DEP, dated March 2, 1998.

EPA has concluded, based on the rationale described in EPA's March 1998 letter (see Exhibit B), that both the acute and chronic aluminum WERs are based on a sound scientific rationale and protect the aquatic life designated use.

As noted in EPA's April 22, 2020 letter to DEP, if in the future Maine adopts the updated nationally recommended aluminum or copper criteria, it would not be protective of aquatic life for DEP to apply WERs (either existing or developed in the future) to those criteria, since the aluminum multiple linear regression (MLR) and copper BLM criteria inherently take into account site-specific conditions. To avoid confusion, EPA recommends that Maine delete all existing aluminum and copper WERs if it adopts the aluminum MLR and copper BLM criteria.

Provisions on Which EPA is Taking No Action

Carbaryl

Maine adopted freshwater and saltwater criteria for carbaryl that are consistent with EPA's nationally recommended 2012 CWA Section 304(a) criteria. These include acute and chronic criteria of 2.1 µg/l for freshwater and an acute criterion of 1.6 µg/l for saltwater. In March 2020, EPA's Office of Pesticide Programs issued a Draft National Level Listed Species Biological Evaluation (BE) for carbaryl.[3] At that point EPA began consultation with USFWS and NMFS under the ESA. Because the results of this consultation will likely be of significant relevance to the Region's consultation on Maine's carbaryl criteria, EPA is deferring action on Maine's adoption of carbaryl criteria pending completion of this national level consultation with USFWS and NMFS.

Non-Substantive WQS Revisions to Chapter 584

EPA considers non-substantive edits to existing WQS to constitute new or revised WQS that it has the authority to approve or disapprove under Section 303(c)(3). While these edits and changes do not substantively change the meaning or intent of the existing WQS, EPA believes it is reasonable to treat such edits and changes in this manner to ensure public transparency as to which provisions are applicable for CWA purposes. EPA notes that the scope of its review and action on non-substantive edits or editorial changes extends only to the edits or changes themselves. EPA is not re-opening or reconsidering the underlying WQS that are the subject of the non-substantive edits or editorial changes.

EPA has reviewed the following items in Chapter 584 and has determined that they are non-substantive revisions to WQS in Chapter 584.

- Reference to the "Board" has been changed to the "Department" in Sections 3.A.(2), 3.A.(2)(b), 3.B., and 3.B.(2)
- Changed "Statewide Criteria" to "Criteria" in the header to Chapter 584 Appendix A.

[3] Draft National Level Listed Species Biological Evaluation for Carbaryl, available online at https://www.epa.gov/endangered-species/draft-national-level-listed-species-biological-evaluation-carbaryl

- Removed the following sentence from the header to Chapter 584 Appendix A, "Patterned after the EPA's National Recommended Water Quality Criteria of November 2002 and December 2003."
- In Table 1 of Chapter 584 - Appendix A the reference for mercury has been changed to, "See *Certain deposits and discharges prohibited*, 38 M.R.S., § 420 (1-B) and §413(11)."
- In Table 1 of Chapter 584 - Appendix A the reference for 2,3,7,8-TCDD Dioxin has been changed to, "Also see 38 M.R.S. § 420(2)."
- The reference to "salt water" in footnote dd of Table 1 of Chapter 584 – Appendix A has been revised to "saltwater".

In accordance with its CWA authority, 33 U.S.C. § 1313(c)(3) and 40 CFR 131, EPA approves the non-substantive editorial changes to Chapter 584 which simply clarify the language in the regulation. The scope of EPA's action in approving such provisions extends only as far as the actual changes themselves. EPA's action here does not constitute an action on the underlying WQS.

Non-WQS Provisions of Chapter 584

Section 303(c) of the CWA requires states to submit new or revised WQS to EPA for review and action. EPA is required to review these changes to ensure revisions to WQS are consistent with the CWA and EPA's implementing regulations. EPA considers four questions when evaluating whether a particular provision is a new or revised WQS. If all four questions are answered "yes", then the provision would likely constitute a new or revised WQS that EPA has the authority and duty to approve or disapprove under CWA § 303(c)(3). EPA has clarified how it determines what is or is not a new or revised WQS, as summarized in EPA's 2012 Frequently Asked Questions (FAQ) publication on the subject.[4]

EPA has reviewed the following items of Chapter 584 and determined they are not WQS. Therefore, EPA is taking no action on changes to these provisions:

- Deletion of the following sentence from Chapter 584.3.B, "Establishment of site-specific criteria must be initiated with a request that the Board assume jurisdiction for issuance of a license."
- For marine toxicity tests, Chapter 584.3.B(1)(c) references the use of Mysid shrimp (*Mysidopsis bahia*) for survival tests. *Mysidopsis bahia* has been changed to *Americamysis bahia* reflecting a formal change to the genus name for this species (see EPA-821-R-02-014).

[4] What is a New or Revised Water Quality Standard under 303(c)(3)? Frequently Asked Questions, EPA No. 820F12017 (Oct. 2012). Available at https://www.epa.gov/sites/production/files/2014-11/documents/cwa303faq.pdf.

Exhibit A

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

June 29, 2020

Dan Arsenault
U.S. EPA – Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912
(617) 918-1562
Arsenault.Dan@epa.gov

Sent via electronic mail
Delivery confirmation requested

RE: Clarification of application of Total Cadmium and associated language in revised 06-096 Code of Maine Rules (CMR) Chapter 584 - Surface Water Quality Criteria for Toxic Pollutants

Dear Dan:

The Department of Environmental (Department) has received your comments regarding the recent changes made to Ch. 584 via rulemaking by the Maine Board of Environmental Protection. We appreciate the review from USEPA as well as the feedback for the changes that we have made. Let me assure you that the Department has not changed its approach in the implementation of metals criteria (evaluated in the total form) and continues to implement criteria as has been historically approved by USEPA.

It seems that some further clarification is necessary for the implementation of metals, or more specifically in this case, cadmium. We have discussed that the Department uses only total metals criteria in our evaluations as cited in Ch. 584(5) (underlined emphasis is mine):

> **5.** The following assumptions have been used to determine the statewide criteria contained in Appendix A of this rule.
>
> **A. Form of metals.** All metals criteria must be considered as total metal.

To be clear, all criteria in Appendix A have been derived as total metal. It is noted that EPA's criteria in *Aquatic Life Ambient Water Quality Criteria for Cadmium* (EPA-820-R-16-002) dated March 2016, were derived as dissolved. When we drafted Ch. 584, we converted these to total metal using EPA's calculator. In addition, all analyses done by the regulated community in compliance with Ch. 584 (and Ch. 530) are reported as total metal, and all MEPDES/WDL permit limits are established as total metal.

That said, Ch. 584 does allow for the use of dissolved metal criteria if a party makes a request to the Department with justification. Based on this information, the Department may allow the

application of dissolved criteria if we believe it to be appropriate. This language is just below Ch. 584 (5)(A) (underlined emphasis is mine):

> NOTE: Persons may request that the Department express criteria for metals as the dissolved form by submitting the appropriate information to allow recalculation of relative toxicity using conversion factors and translator procedures published by EPA: "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion", EPA 823-B-96-007, USEPA, Office of Water, Washington, DC, June 1996.

The above cited language did not undergo any changes in this most recent update of Ch. 584, and the Department's approach to analysis of metals remains the same, as stated. We have not received any comments in contradiction to this approach or this language from USEPA to this point.

I believe that the changes to Section 7 at the end of Ch. 584 require greater explanation at this time. The only changes to this section under this revision are highlighted in teal below.

B. Parameters for Calculating Freshwater Metals Criteria That Are Hardness-Dependent

Chemical	m_A	b_A	m_C	b_C
Cadmium	0.97899	-3.866	0.7977	-3.909
Chromium III	0.8190	3.7256	0.8190	0.6848
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59	--	--
Zinc	0.8473	0.884	0.8473	0.884

Hardness-dependent metals' criteria, as total metal, may be calculated from the following.

$CMC = \exp\{m_A [\ln(\text{hardness})] + b_{ar}\}$

$CCC = \exp\{m_C [\ln(\text{hardness})] + b_C\}$

A conversion factor for freshwater cadmium criteria is then applied to the above stated calculation for CCC and CMC as stated in EPA's *Aquatic Life Ambient Water Quality Criteria for Cadmium* (EPA-820-R-16-002) dated March 2016. Freshwater acute and chronic conversion factors for cadmium are 1.011 and 0.976, respectively.

The numeric values in the table changed as a result of USEPA's updated cadmium water quality criteria document cited below the table. To justify the change in the chemical inputs in the table, the Department believed it was important to cite the document. Also, the previous version of Ch. 584 did not give the hardness-specific conversion factors to convert total metal to dissolved if we opted to do that under the authority of the Section 5.A Note cited above, so we included these factors as well.

During USEPA's review of Ch. 584 prior to Board of Environmental Protection approval, Jennifer Brundage of USEPA noticed an earlier version of Ch. 584 had incorrectly used a hardness of 100 mg/L to calculate the cadmium criteria and expressed this in an email dated September 17, 2019 to Jeanne Voorhees included here:

> Hi Jeanne,
>
> ME's draft acute cadmium criterion for freshwater is **1.82 ug/L**, stated per footnote E have been calculated at a water hardness of 20 mg/L.
> (Footnote E: "*The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 20 mg/L. Also see part 7 below. under "Additional Notes" after Table II.*"
> EPA's acute freshwater cadmium 304(a) recommendation is **1.8 ug/L**, but this is calculated at a water hardness of 100 mg/L.
> At a water hardness of 20 mg/L, the calculated acute cadmium criterion is **0.40 ug/L**.
>
> Similarly, the chronic freshwater cadmium criterion presented in table 1 of MEDEP's proposed revisions is 0.70 ug/L, stated per footnote E to have been calculated at a water hardness of 20 mg/L. 0.70 ug/L is in fact the calculated criterion at a water hardness of 100 mg/L. At a water hardness of 20 mg/L, the calculated chronic criterion should be 0.21 ug/L.
>
> DEP should either delete reference to footnote E and add a new footnote to clarify that the calculated cadmium criteria presented in table 1 are based on a water hardness of 100 mg/L or update their calculated criteria to accurately reflect the calculations at a water hardness of 20 mg/L.
>
> Thanks,
> Jenn

The Department followed the latter recommendation and responded by correcting the calculated criteria to reflect a water hardness of 20 mg/L.

The Department has not changed any other language associated with Section 7 as what was included was simply a citation of the updated USEPA criteria document and hardness specific conversion factors. No operational changes (dissolved versus total) are proposed or discussed. The narrative section of Ch. 584 clearly states that total forms of metals must be used for the evaluation of criteria and we explain how the criteria is achieved in Section 7. However, the Department allows for the use of dissolved metals criteria where appropriate and Department-approved. Therefore, we would only apply the language in 7.B "A conversion factor for freshwater cadmium criteria is then applied…" if we were acting on a request to do so as allowed in the Note in Sec. 5.A. of the rule. To my knowledge this has never occurred.

Given this reading of rule, and the Department's longstanding implementation of the rule in this manner, the Department does not believe that any emergency changes or measures need to be taken to amend Ch. 584 at this time. The Department has conveyed our intent to update the ammonia and aluminum criteria in the near future once watershed-specific data can be collected. If USEPA believes that the language in Section 7 should be made clearer, the Department is open to clarifying the language at that time. As you may know, the rulemaking process is lengthy and complex and takes a lot of staff time to complete. Therefore, it is generally only undertaken when there are significant changes to be made.

Once again, thank you for your review of the Ch. 584.

Please feel free to contact Cindy Dionne at 287-7823, or cindy.l.dionne@maine.gov, or me at 287-7700, or brian.w.kavanah@maine.gov, with any comments or questions.

Sincerely,

Brian Kavanah, Director
Bureau of Water Quality

ec: Barry Mower, DEP
Gregg Wood, DEP
Cindy Dionne, DEP

Exhibit B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

March 2, 1998

Barry Mower
Bureau of Land and Water
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Dear Barry:

On December 3, 1997 representatives from Georgia Pacific Corporation, MEDEP, and EPA met and discussed the St. Croix River aluminum water effect ratio (WER) study that was conducted by AScI Corporation for Georgia Pacific. Representatives of AScI also participated in the technical discussions via telephone conference call. EPA agreed to send written confirmation of its position with regard to determining a final WER from the study results and its position regarding use in the NPDES permitting process of a WER based site-specific aluminum criterion once formally adopted by Maine. Our position is outlined below.

Establishing A Final WER

By review dated June 5, 1997, you indicated that the lowest WER for either of the two test species should be used as the final WER. This is a WER of 6.1 based on the November 30, 1995 Ceriodaphnia dubia test. We concur that the WER of 6.1 is the largest WER that should be selected from the available information. The following are two primary factors contributing to this position.

1) The pH was reported to range from 6.8 to 8.0, with a pH most frequently in the low 7's to 7.7 - 7.8 during all of the toxicity tests in simulated downstream site water. This includes the April 96 WER test that was intended to represent spring snowmelt/runoff conditions. The pH of the St. Croix River sample collected (prior to mixing with effluent) for the April 1996 testing was reported at 7.0.

US Geological Survey data indicate that it is not unusual for the pH in the St. Croix River to be 6.5 - 6.6. We are concerned that aluminum might have demonstrated greater toxicity in site water if the tests had been run at this lower pH. Greater toxicity in site water would equate to smaller WERs. The basis for this concern was discussed in some detail at the meeting and we understood AScI to agree that the concern is reasonable.

2) The toxicity test end points for Ceriodaphnia dubia in laboratory water were below the 87 ug/l national chronic criterion for aluminum (Maine's criterion). For the November 30, 1995 Ceriodaphnia dubia test that the WER of 6.1 is based on, the comparison is an end point of 67 ug/l in the laboratory water vs. the criterion to be modified of 87 ug/l. Using the criterion as a point of reference, such

results can produce WERs greater than one that are at least partially a function of increased toxicity in laboratory water as opposed to decreased toxicity in site water. WERs greater than one are intended to be a result of properties in site water that decrease the toxicity of a chemical.

NPDES Permitting

1) Because of the uncertainty associated with the data, establishment of permit limits should consider what Georgia Pacific can achieve vs. full allocation of a site-specific criterion based on a WER of 6.1. The study should not be used to allow an increase from the current amount of aluminum discharged. Any possibility that Georgia Pacific can reasonably achieve better than the current discharge level should be considered.

2) The permit should include a requirement for follow-up analyses. EPA's WER guidance (Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals, EPA-823-B-94-001, February 1994) recommends that WERs be reevaluated whenever events occur that might substantially impact future characteristics of the effluent or receiving water, such as events that might impact the concentration of the metal, hardness, alkalinity, pH, suspended solids, organic carbon or other toxic materials. The guidance further recommends that WERs be periodically reevaluated even if no known changes have occurred. The follow-up analysis should be designed to address key areas of uncertainty in the existing WER data.

3) Another important consideration in addressing the discharge of metals is fate and transport. The Region's interim strategy for addressing fate and transport concerns when establishing permit limits in conjunction with site-specific criteria is outlined in an October 28, 1994 letter from EPA to the Massachusetts Department of Environmental Protection. A copy of that letter is enclosed.

We hope this assists in moving the aluminum discharge issue at the Georgia Pacific Woodland facility to resolution. If you have any questions, please contact me at 617/565-3539.

Sincerely,

Bill

William R. Beckwith
Water Quality Standards Coordinator

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